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13

14 UNITED STATES DISTRICT COURT  
15 NORTHERN DISTRICT OF CALIFORNIA  
16 SAN JOSE DIVISION

17 SPACE DATA CORPORATION,  
18 Plaintiff,  
19 v.  
20 ALPHABET INC., GOOGLE LLC, AND  
LOON LLC,  
21 Defendants.  
22

Case No. 5:16-cv-03260-BLF (NMC)

**EXHIBITS 2, 12, 18, 19, 20, 21, 22, 27, 34,  
38, 40 TO DECLARATION OF  
MATTHEW M. WERDEGAR IN  
SUPPORT OF DEFENDANTS' MOTION  
OF SUMMARY JUDGMENT**

Judge: Hon. Beth Labson Freeman

Date Filed: June 13, 2016

Trial Date: August 5, 2019

24 **REDACTED VERSIONS OF DOCUMENTS SOUGHT TO BE SEALED**  
25  
26  
27  
28

## **EXHIBIT 2**

**REDACTED VERSION OF  
DOCUMENT SOUGHT TO BE  
SEALED**

**APPENDIX A to the Expert Report of Sam Pullen**

Technology Overview and Elements

[HIGHLY CONFIDENTIAL – ATTORNEYS' EYES ONLY]

## OVERVIEW OF LOON

1. This Overview of Loon section outlines Loon's<sup>1</sup> technology to support the claim-by-claim and limitation-by-limitation analysis below. The main body of the report describes the Accused Product. This section establishes certain technical aspects of the Accused Product. There may be some information that is not specifically about Loon's technology, but that information also supports those arguments. Some important additional technical background is found in the Technology section of the main report.

2. The report sets out specific citations to documents and deposition testimony. These citations are not intended to be exhaustive but instead exemplary. I reserve the right to use other supporting material, based in part on the citations herein. In addition, support for the discussion in this overview is found throughout the report and, in particular, in the "Elements" section below.

3. In addition, I rely on the knowledge I gleaned from an inspection of a Loon Payload, Down Connector, ACS, base board, and Top Plate on August 23 and 24, 2018. On those dates, I visited a "Rails 2," a Google X facility in Mountain View, California and inspected and disassembled a Loon Payload, ACS, base board, and Top Plate (among other components). I was assisted during this inspection by counsel, but I directed the disassembly and taking of photographs and videos documenting the various components. According to a document

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<sup>1</sup> When I refer to Loon, Project Loon, or Google, I am referring collectively to the Defendants in the lawsuit captioned *Space Data Corporation, v. Alphabet Inc., et al.*, No. 16-cv-03260 (N.D. Cal.), filed June 13, 2016.



produced by Google representing the “BOM” (that is Bill of Materials) provided by Google, the payload and components I inspected where from a V1.2 Loon Flight Vehicle.<sup>2</sup>

## **I. Detailed Discussion of Loon Technology**

4. This section provides a detailed discussion of the Google Accused Product, that is, Google’s Loon Technology, including the Loon Flight Vehicle; Loon Operations [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]; as well as Loon’s

manufacture and control of Loon balloons.

### **A. The Loon Flight Vehicle**

5. The Loon Flight Vehicle includes a number of components, including, among others, a

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED].

---

<sup>2</sup> See *V1.2 Flight Vehicle Cost – Hatchery BOM for Payload*, GOOG-SD-00303636-GOOG-SD-00303642 (created on September 7, 2018) at GOOG-SD-00303636.

<sup>3</sup> See, e.g., *Loon: Flight System Overview*, March 2-3, 2016, GOOG-SD-00070435-GOOG-SD-00070487 at GOOG-SD-00070439.

Loon Mission Control.<sup>553</sup>

301. Therefore, as shown above and throughout this report, it is my opinion that element 1a is performed by Google.

**C. Element 1b1**

302. The text for element 1b1 is “*determining locations of one or more neighbor balloons relative to the determined location of the target balloon,*”

**Evidence of Infringement**

303. It is my opinion that Google performs the step of “determining locations of one or more neighbor balloons relative to the determined location of the target balloon.” This is evident from the Google documents, deposition testimony, and other evidence cited herein.

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<sup>553</sup> *Project Loon - Mission Control*, GOOG-SD-00025594-GOOG-SD-00027429 (last modified on January 24, 2017) at GOOG-SD-00025950.

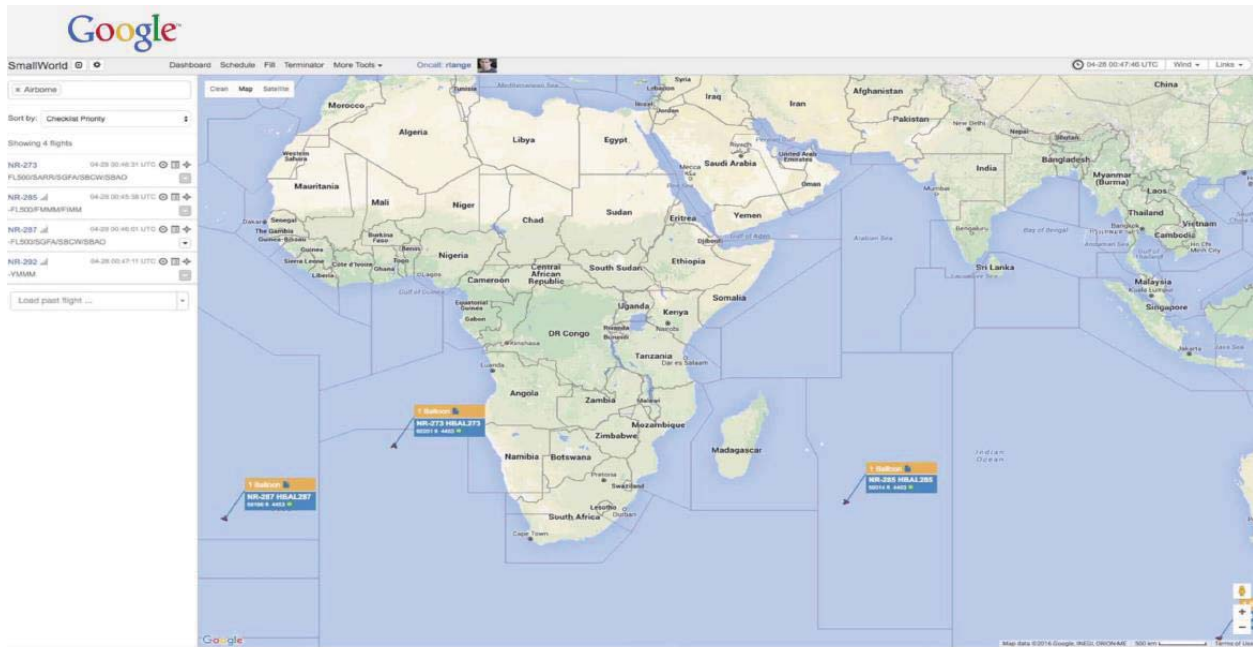
304. In support of my opinion, see the evidence cited throughout this report, in the Overview of Loon section above, and Claims 1 of the '193 Patent. In particular, see the evidence cited in elements 1a and 1c1.

305. As explained in the Primary Flight Controller and Loon Mission Control sections in the Detailed Description of Loon Technology above, and in element 1a above, Loon Mission Control continuously determines the location of each and every one of Loon's balloons. As explained above, those determinations of location include, among other data points, each balloon's latitude, longitude, altitude, and time. Each balloon's location, expressed as a three-dimensional point in time, is relative to every other balloon's location expressed in the same manner.

306. In addition, for the benefit of its flight engineers, as shown below, Google, in its Smallworld UI, plots each balloon's relative location above the Earth's surface on a map.<sup>554</sup> Google's documents contain many such images, and the one below is shown merely as an example.

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<sup>554</sup> *SmallWorld UI Flight Engineer Training Program*, GOOG-SD-00138074- GOOG-SD-00138156 (last modified on August 22, 2017) at GOOG-SD-00138077.



307. The status of balloons as ‘neighbor balloons’ can be decided in many different ways. This decision could be based on distances between the balloons, it could include all of the balloons in the fleet. For example, the high level allocation and dispatch of balloons is based on the Loon balloons’ relative distribution around the globe.<sup>555</sup>

308. [REDACTED]

[REDACTED]

<sup>555</sup> A detailed discussion of how Loon’s fleet management system, using the Oregon Dispatcher program, makes these decisions can be found in the “Dispatch” section of the Detailed Discussion of Loon Technology above.

<sup>556</sup> *Google Loon Flight Operations, Dispatch*, GOOG-SD-00064339 (created on April 21, 2017).

<sup>557</sup> Candido Tr. at 151:14-21.

491. Therefore, as shown above and throughout this report, it is my opinion that element 14a is satisfied by Google's Accused Product.

**C. Element 14b1**

492. The text for element 14b1 is "*determining locations of one or more neighbor balloons relative to the determined location of the target balloon,*"

**Evidence of Infringement**

493. It is my opinion that Google's Accused Product, and specifically Google's data centers include a non-transitory computer readable medium having stored therein instructions executable by a computing device to cause the computing device to perform various functions, including "determining locations of one or more neighbor balloons relative to the determined location of the target balloon." This is evident from the Google documents, deposition testimony, and other evidence cited herein.

494. In support of my opinion, see the evidence cited throughout this report, in the Overview of Loon section above, and Claim 1 and 14 of the '193 Patent. In particular, see the evidence cited in element 1b1 and 14pre.

495. Therefore, as shown above and throughout this report, it is my opinion that element 14b1 is satisfied by Google's Accused Product.

**D. Element 14b2**

496. The text for element 14b2 is "*wherein a desired movement of the target balloon comprises a desired horizontal movement of the target balloon;*"

**Evidence of Infringement**

497. It is my opinion that Google's Accused Product, and specifically Google's data centers include a non-transitory computer readable medium having stored therein instructions executable by a computing device to cause the computing device to perform various functions,

## **EXHIBIT 12**

**REDACTED VERSION OF  
DOCUMENT SOUGHT TO BE  
SEALED**

IN THE UNITED STATES DISTRICT COURT  
 FOR THE NORTHERN DISTRICT OF CALIFORNIA  
 SAN JOSE DIVISION

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SPACE DATA CORPORATION, )  
 )  
 Plaintiff, )  
 )  
 vs. ) 5:15-cv-03260-BLF  
 )  
 ALPHABET INC., and GOOGLE LLC, )  
 )  
 Defendants. )  
 )

HIGHLY CONFIDENTIAL, ATTORNEYS' EYES ONLY

VIDEO DEPOSITION OF

MICHAEL PEARSON

June 7, 2018

REPORTED BY BRANDON D. COMBS, RPR, CSR 12978  
 438778



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 (310) 207-8000 Century City  
 (916) 922-5777 Sacramento  
 (951) 686-0606 Riverside  
 (212) 808-8500 New York City  
 (312) 379-5566 Chicago

(415) 433-5777 San Francisco  
 (408) 885-0550 San Jose  
 (800) 222-1231 Martinez  
 (818) 702-0202 Woodland Hills  
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 00+1+800 222 1231 Paris

(949) 955-0400 Irvine  
 (760) 322-2240 Palm Springs  
 (702) 366-0500 Las Vegas  
 (702) 366-0500 Henderson  
 (518) 490-1910 Albany  
 00+1+800 222 1231 Dubai

(858) 455-5444 San Diego  
 (800) 222-1231 Carlsbad  
 (800) 222-1231 Monterey  
 (516) 277-9494 Garden City  
 (914) 510-9110 White Plains  
 001+1+800 222 1231 Hong Kong

IN THE UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF CALIFORNIA  
SAN JOSE DIVISION

--oOo--

SPACE DATA CORPORATION, )  
 )  
Plaintiff, )  
 )  
vs. ) 5:15-cv-03260-BLF  
 )  
ALPHABET INC., and GOOGLE LLC, )  
 )  
Defendants. )  
\_\_\_\_\_ )

HIGHLY CONFIDENTIAL, ATTORNEYS' EYES ONLY

VIDEO DEPOSITION OF  
MICHAEL PEARSON

\_\_\_\_\_  
June 7, 2018

REPORTED BY BRANDON D. COMBS, RPR, CSR 12978

Job 438778



11:31 1 A. In lay terms, sure.

11:31 2 Q. And you say, yes, I'm in for the call?

11:31 3 A. Yep.

11:31 4 Q. And I'm sure you don't recall the details  
11:31 5 of that call now?

11:31 6 A. No, I do not.

11:31 7 Q. Let me show you [Exhibit 221](#).

11:32 8 (Whereupon, [Exhibit 221](#) was marked for  
11:32 9 identification.)

11:32 10 BY MR. HOSIE:

11:32 11 Q. Earlier, sir, I asked you if Space Data  
11:32 12 and Google executed the NDA, and you indicated you  
11:32 13 couldn't remember.

11:32 14 If you could please look at 221 and  
11:32 15 confirm to me that this is in fact a fully executed  
11:32 16 Space Data/Google NDA?

11:32 17 MR. WONG: And, obviously, Mr. Pearson,  
11:32 18 you can take your time to look through any exhibit  
11:32 19 that --

11:32 20 MR. HOSIE: Hundred percent.

11:32 21 MR. WONG: -- Mr. Hosie gives you.

11:32 22 BY MR. HOSIE:

11:32 23 Q. Hundred percent. If you need time to read  
11:32 24 a doc, just say, hey, Hosie, I need time. You can  
11:32 25 even call me Hosie. I won't be offended. I've been

11:32 1 called worse.

11:32 2 A. Yes, it appears that, if this is the same  
11:32 3 NDA, that the signatures of Gerald Knoblach and  
11:32 4 then, from our side, Matt Sucherman, which I assume  
11:32 5 would make it an executed agreement.

11:33 6 Q. Okay.

11:33 7 (Whereupon, [Exhibit 222](#) was marked for  
11:33 8 identification.)

11:33 9 BY MR. HOSIE:

11:33 10 Q. Now let me show you what's been marked as  
11:33 11 [Exhibit 222](#).

11:33 12 Counsel.

11:33 13 Take your time to read this one, please,  
11:33 14 starting at the back. It's an email chain, and it's  
11:33 15 always sensible, at least in my view, to read  
11:33 16 chronologically from the oldest to the newest.

11:34 17 A. Okay.

11:34 18 Q. So this is an email chain that starts with  
11:34 19 you and Chris Sacca emailing back and forth?

11:34 20 A. Yeah, looks so.

11:35 21 Q. And it starts with an email from Chris to  
11:35 22 you. You would be the Mike there, as you read that?

11:35 23 A. I believe so, yeah.

11:35 24 Q. Yeah. And he says, Mike, in regards to  
11:35 25 your earlier message about Space Data, you are not

02:56 1 THE WITNESS: I mean, stew or not, just  
02:56 2 not continue conversations for a while, while we  
02:56 3 figure out what we want to do.

02:56 4 BY MR. HOSIE:

02:56 5 Q. And did this Space Data evaluation prompt  
02:57 6 Google to do a build versus buy analysis on a  
02:57 7 balloon Internet constellation technology?

02:57 8 MR. WONG: Objection. Vague, foundation.

02:57 9 THE WITNESS: I don't know.

02:57 10 BY MR. HOSIE:

02:57 11 Q. One way or the other?

02:57 12 A. One way or the other.

02:57 13 Q. Because you don't know anything about how  
02:57 14 Loon came to be born at Google, do you?

02:57 15 A. I don't know.

02:57 16 Q. Let me show you what I marked as

02:57 17 [Exhibit 233](#).

02:57 18 (Whereupon, [Exhibit 233](#) was marked for  
02:57 19 identification.)

02:57 20 BY MR. HOSIE:

02:57 21 Q. You might want to read this one from the  
02:57 22 bottom up, chronologically.

02:57 23 A. Sorry, which part should I start with?

02:57 24 The last page, or the --

02:57 25 Q. Well, start with the email on February 24,

02:57 1 on the first page. I think I can limit our -- start  
02:57 2 the Sunday, February 25 email from Ingersoll, Jim.

02:58 3 A. Yep.

02:58 4 Q. All right. So, you respond to Ingersoll's  
02:58 5 email, do you not?

02:58 6 A. I do.

02:58 7 Q. And you say, you are so much nicer than I  
02:58 8 am. I was going to go silent for longer and let  
02:58 9 them stew and wonder what happened, happy face.

02:58 10 I read that correctly?

02:58 11 A. Yes.

02:58 12 Q. So does this refresh your recollection  
02:58 13 that you were part of a group that decided in the  
02:58 14 Thursday noon meeting earlier in the week that you  
02:58 15 all were going to let Space Data stew?

02:59 16 MR. WONG: Objection. Assumes facts.

02:59 17 THE WITNESS: I don't know what happened  
02:59 18 in the Thursday meeting, but my recollection is that  
02:59 19 we decided to kind of go silent.

02:59 20 BY MR. HOSIE:

02:59 21 Q. Isn't it true, sir, that Google seized on  
02:59 22 the Wall Street Journal article as a pretext to turn  
02:59 23 Space Data down?

02:59 24 MR. WONG: Objection. Foundation and  
02:59 25 assumes facts not in evidence.

03:12 1 individual. Time is 3:12 P.M. on June 7, 2018.

03:12 2 BY MR. HOSIE:

03:12 3 Q. Let me show you what's been marked as  
03:12 4 Exhibit 234.

03:12 5 (Whereupon, Exhibit 234 was marked for  
03:12 6 identification.)

03:13 7 BY MR. HOSIE:

03:13 8 Q. You got a chance to read this, sir?

03:13 9 A. Yeah, I skimmed it.

03:13 10 Q. That's an email chain that you're on at  
03:13 11 the final email?

03:13 12 A. Yes.

03:13 13 Q. And it's dated, the final email is dated  
03:13 14 June 6, 2008?

03:13 15 A. Yes.

03:13 16 Q. Is this before or after Google had the  
03:13 17 final thumbs down decision on Space Data?

03:13 18 MR. WONG: Objection. Assumes facts and  
03:13 19 vague. Foundation.

03:13 20 THE WITNESS: It's after the Wall Street  
03:13 21 Journal article came out, and we decided to go  
03:13 22 silent for a while.

03:13 23 BY MR. HOSIE:

03:13 24 Q. Is this the -- during the go silent for a  
03:13 25 while period, or after Google said, we're just going

03:19 1 not clear from the email chain exactly which  
03:19 2 technology is being referenced.

03:19 3 If you look back at Dylan's email, he's  
03:19 4 kind of going on a, again, the game of telephone of  
03:19 5 just, I want to try and put Internet into dark  
03:19 6 places. And there may be some kind of notions of  
03:19 7 how to make that happen.

03:19 8 BY MR. HOSIE:

03:19 9 Q. Let me see if I can sharpen your  
03:19 10 recollection with Exhibit 116.

03:19 11 I'm going to ask you about the top email  
03:19 12 from Ingersoll to Alder, copied to you and many  
03:20 13 others.

03:20 14 A. Okay.

03:20 15 Q. All right. So this is dated July 1, 2008?

03:20 16 A. Yes.

03:20 17 Q. Is this before or after the thumbs down  
03:20 18 decision on Space Data at Google?

03:20 19 MR. WONG: Objection. Assumes facts and  
03:20 20 vague, foundation.

03:20 21

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11/11/2019




11 of 11

Page 10 of 10

Page 10 of 10

Page 10 of 10

11 of 11

11 of 12

**Figure 1**

11 of 11

11 of 12

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11 of 12

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11 of 12

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03:21

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[REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED] [REDACTED]

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[REDACTED] [REDACTED]

[REDACTED] [REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

03:22 24

BY MR. HOSIE:

03:22 25

Q. That's what it says?



DEPOSITION OFFICER'S CERTIFICATE

STATE OF CALIFORNIA            )  
  ) ss.  
COUNTY OF SAN FRANCISCO    )

I, Brandon Combs, hereby certify:

I am a duly qualified Certified Shorthand  
Reporter in the State of California, holder of  
Certificate Number CSR 12978 issued by the Certified Court  
Reporters' Board of California and which is in full  
force and effect. (Fed. R. Civ. P. 28(a)(1)).

I am authorized to administer oaths or  
affirmations pursuant to California Code of Civil  
Procedure, Section 2093(b) and prior to being examined,  
the witness was first duly sworn by me. (Fed. R. Civ.  
P. 28(a)(a)).

I am not a relative or employee or attorney or  
counsel of any of the parties, nor am I a relative or  
employee of such attorney or counsel, nor am I  
financially interested in this action. (Fed. R. Civ. P.  
28).

I am the deposition officer that  
stenographically recorded the testimony in the foregoing  
deposition and the foregoing transcript is a true record

/ / /

1 of the testimony given by the witness. (Fed. R. Civ. P.  
2 30(f)(1)).

3 Before completion of the deposition, review of  
4 the transcript [ ] was [XX] was not requested. If  
5 requested, any changes made by the deponent (and  
6 provided to the reporter) during the period allowed, are  
7 appended hereto. (Fed. R. Civ. P. 30(e)).

8  
9 Dated: June 13, 2018

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14 \_\_\_\_\_

## **EXHIBIT 18**

**REDACTED VERSION OF  
DOCUMENT SOUGHT TO BE  
SEALED**

IN THE UNITED STATES DISTRICT COURT  
 NORTHERN DISTRICT OF CALIFORNIA  
 SAN JOSE DIVISION

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SPACE DATA CORPORATION,	)	
	)	
Plaintiff,	)	
	)	
vs.	)	Case No.
	)	5:16-cv-03260
ALPHABET, INC., and GOOGLE,	)	-BLF
INC.,	)	
	)	
Defendants.	)	
	)	

---o0o---

WEDNESDAY, JUNE 27, 2018  
 VIDEOTAPED DEPOSITION OF LARRY PAGE  
 HIGHLY CONFIDENTIAL, ATTORNEYS' EYES ONLY

---o0o---

REPORTER: BALINDA DUNLAP, CSR 10710, RPR, CRR, RMR  
 439674



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 (916) 922-5777 Sacramento  
 (951) 686-0606 Riverside  
 (212) 808-8500 New York City  
 (312) 379-5566 Chicago

(415) 433-5777 San Francisco  
 (408) 885-0550 San Jose  
 (800) 222-1231 Martinez  
 (818) 702-0202 Woodland Hills  
 (347) 821-4611 Brooklyn  
 00+1+800 222 1231 Paris

(949) 955-0400 Irvine  
 (760) 322-2240 Palm Springs  
 (702) 366-0500 Las Vegas  
 (702) 366-0500 Henderson  
 (518) 490-1910 Albany  
 00+1+800 222 1231 Dubai

(858) 455-5444 San Diego  
 (800) 222-1231 Carlsbad  
 (800) 222-1231 Monterey  
 (516) 277-9494 Garden City  
 (914) 510-9110 White Plains  
 001+1+800 222 1231 Hong Kong

IN THE UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA  
SAN JOSE DIVISION

---o0o---

SPACE DATA CORPORATION,	)	
	)	
Plaintiff,	)	
	)	
vs.	)	Case No.
	)	5:16-cv-03260
ALPHABET, INC., and GOOGLE,	)	-BLF
INC.,	)	
	)	
Defendants.	)	
	)	

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WEDNESDAY, JUNE 27, 2018  
VIDEOTAPED DEPOSITION OF LARRY PAGE  
HIGHLY CONFIDENTIAL, ATTORNEYS' EYES ONLY

---o0o---

REPORTER: BALINDA DUNLAP, CSR 10710, RPR, CRR, RMR

1 A. No, I don't recall exactly when.

2 Q. Do you recall, was it close on the heels  
3 of your visit or did it lag that by many, many  
4 months?

01:03 5 A. No, I don't recall.

6 Q. Was it more than a year later, do you  
7 recall that much at least?

8 A. I don't have any reason to think that.

9 Q. You think that the meeting, the  
01:03 10 discussion, the consensus --

11 A. Well, that seems highly implausible.

12 Q. Yes, you'd expect it to have happened  
13 sooner relative to the -- your tour, correct?

14 A. But I don't recall.

01:03 15 Q. All right, sir. Do you recall why Google  
16 decided not to go forward with Space Data, the why  
17 of it?

18 A. Well, I can give you my recollection. I  
19 mean, it was a long time ago.

01:03 20 Q. Please.

21 [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1

[REDACTED]

2

[REDACTED]

3

[REDACTED]

4

[REDACTED]

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[REDACTED]

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[REDACTED]

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[REDACTED]

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[REDACTED]

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[REDACTED]

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[REDACTED]

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[REDACTED]

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[REDACTED]

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[REDACTED]

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[REDACTED]

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[REDACTED]

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[REDACTED]

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[REDACTED]

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[REDACTED]

01:05 25

(Phone interruption.)

1 Do you recall saying, "Hey, Dylan, can you  
2 explore whether we can do this?"

3 A. I've already answered that question.

4 Q. And you don't recall?

02:45 5 A. No.

6 Q. Thank you.

7 MR. HOSIE: Why don't we take a quick  
8 break.

9 THE WITNESS: Okay.

02:45 10 THE VIDEOGRAPHER: This is the end of Disc  
11 No. 1, Volume I in the deposition of Larry Page.  
12 The time is 2:45 p.m., and we're off the record.

13 (Whereupon a recess was taken.)

14 (Reporter marked Exhibit No. 330 for  
02:57 15 identification.)

16 THE VIDEOGRAPHER: Back on the record.  
17 This is the beginning of Disc No. 2, Volume I in  
18 the deposition of Larry Page. The time is  
19 2:57 p.m. on June 27th, 2018.

02:57 20 Q. BY MR. HOSIE: Mr. Page, in our break, I  
21 placed before you what's been marked as  
22 Exhibit 330. If you could take a minute and read  
23 that before I ask you questions.

24 A. Yes, of course. Okay.

02:58 25 Q. So this is an email chain, is it not, sir?



1 A. Yes, it's an email chain.

2 Q. And it begins with an email from you on  
3 November 13th, 2010, at 10:07 in the evening?

4 A. Yes.

02:58 5 Q. And it's to Sebastian Thrun?

6 A. Yeah, that's the way it looks.

7 Q. And Sebastian Thrun was working at X at  
8 the time, wasn't he, sir?

9 A. I think so, yeah.

02:58 10 Q. And you sent him some information about a  
11 balloon project, did you not?

12 A. Sorry, I don't remember when X got formed,  
13 the year exactly, but we had some sort of X-like  
14 thing.

02:58 15 Q. "X-like thing." I'll take that.

16

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[REDACTED]

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03:01

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14

Q. Okay. And you don't, in fact, know what Mr. -- whether Mr. Thrun even started looking at a balloon-borne Internet constellation in 2010, also true?

A. I mean, I assume he did something, based on the email, but I don't know for sure.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1 take a look at that.

2 MR. VAN NEST: This was previously marked,  
3 Counsel --

4 MR. HOSIE: It was.

03:02 5 MR. VAN NEST: -- 249? Thank you.

6 THE WITNESS: Sorry, is this the same day?

7 Q. BY MR. HOSIE: No, this is several days  
8 later. You sent an email on November 15th to  
9 Sebastian Thrun.

03:02 10 A. That's the same day as on the previous  
11 email.

12 Q. It is, but it's several days after you  
13 started the email chain with Mr. Thrun on Saturday  
14 night.

03:02 15 A. It started six minutes after the -- the  
16 last response there.

17 Q. Which was on Monday, and you started that  
18 chain on Saturday night?

19 A. Yep.

03:02 20 Q. Okay. That's the sequence?

21 A. Okay.

22 Q. So you respond minutes later to Mr. Thrun,  
23 do you not?

24 A. Yeah.

03:02 25 Q. And you say, "Okay. Check out" -- and you

1 link, again, to a Space Data public site?

2 A. Yeah, there's -- it looks like there's a  
3 PDF on their site.

4 Q. Yeah.

03:02 5 A. And I tell him that we launched one of the  
6 balloons.

7 Q. And you say, "Sergey and I launched one of  
8 these ourselves"?

9 A. Yep.

03:03 10 Q. And then what does Mr. Thrun do with your  
11 email, sir?

12 A. I don't know.

13 Q. Well, look at the top. Doesn't he forward  
14 it to Astro Teller?

03:03 15 A. Oh, sorry. Okay.

16 Q. Is that correct?

17 A. Yeah, sorry, there's other stuff in here,  
18 too, but I assume that's correct.

19 Q. Well, because that's what it says.

03:03 20 A. So --

21 Q. That's what it says, sir. Mr. Thrun  
22 forwarded your email to Astro Teller, correct?

23 [REDACTED]

[REDACTED]

[REDACTED]



1 But, yeah, I think so.

2 Q. All right. Now, tell me what you know  
3 about Mr. Thrun's personal involvement in the  
4 earliest days of Loon at Google.

03:04 5 A. Sorry, there's some data here on --

6

7 Q. Yes, I know.

8 A. Okay.

9 Q. It's not like this was -- Space Data was  
03:04 10 your sole obsessive concern at the time.

11 So my question, Mr. Page, please tell me  
12 what you know of Mr. Thrun's involvement in Google  
13 Loon in their earliest days alive.

14 A. I don't know.

03:04 15 Q. Well, was he involved?

16 A. I don't know.

17 Q. Let me show you what's been marked as our  
18 next in order. This is Exhibit 331.

19 Counsel.

03:04 20 (Reporter marked Exhibit No. 331 for  
21 identification.)

22 THE WITNESS: Okay.

23 Q. BY MR. HOSIE: It's an email from  
24 Sebastian Thrun, correct?

03:04 25 A. Yes, it is.

1 DEPOSITION OFFICER'S CERTIFICATE

2 STATE OF CALIFORNIA )  
 ) ss.  
 3 COUNTY OF SAN FRANCISCO )

4  
 5  
 6 I, BALINDA DUNLAP, hereby certify:

7 I am a duly qualified Certified Shorthand  
 8 Reporter in the State of California, holder of  
 9 Certificate Number CSR 10710 issued by the Certified Court  
 10 Reporters' Board of California and which is in full  
 11 force and effect. (Fed. R. Civ. P. 28(a)(1)).

12 I am authorized to administer oaths or  
 13 affirmations pursuant to California Code of Civil  
 14 Procedure, Section 2093(b) and prior to being examined,  
 15 the witness was first duly sworn by me. (Fed. R. Civ.  
 16 P. 28(a)(a)).

17 I am not a relative or employee or attorney or  
 18 counsel of any of the parties, nor am I a relative or  
 19 employee of such attorney or counsel, nor am I  
 20 financially interested in this action. (Fed. R. Civ. P.  
 21 28).

22 I am the deposition officer that  
 23 stenographically recorded the testimony in the foregoing  
 24 deposition and the foregoing transcript is a true record

25 / / /



1 of the testimony given by the witness. (Fed. R. Civ. P.  
2 30(f)(1)).

3 Before completion of the deposition, review of  
4 the transcript [XX] was [ ] was not requested. If  
5 requested, any changes made by the deponent (and  
6 provided to the reporter) during the period allowed, are  
7 appended hereto. (Fed. R. Civ. P. 30(e)).

8 Dated: JULY 13, 2018

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## **EXHIBIT 19**

**REDACTED VERSION OF  
DOCUMENT SOUGHT TO BE  
SEALED**

**From:** "Larry Alder" <lalder@google.com>  
**To:** "Dylan Casey" <dcasey@google.com>  
**Sent:** Fri, 6 Jun 2008 11:16:49 -0700  
**Subject:** Re: Google's 10th bday  
**Cc:** "Megan Smith" <megans@google.com>, "Marissa Mayer" <marissa@google.com>, "Mike Pearson" <pearson@google.com>, "Sunil Daluvoy" <sunild@google.com>, "Jack Ancone" <ancone@google.com>, "David Lawee" <dlawee@google.com>

We visited on February 15, 2008.

---Larry A.

On Fri, Jun 6, 2008 at 10:44 AM, Dylan Casey <dcasey@google.com> wrote:

Larry...when did you all visit? [REDACTED]

On Fri, Jun 6, 2008 at 1:16 PM, Larry Alder <lalder@google.com> wrote:

Megan,

[REDACTED]

---Larry A.

On Fri, Jun 6, 2008 at 10:10 AM, Megan Smith <megans@google.com> wrote:

Dylan,

[REDACTED]

This is a pretty fun idea. A little crazy, but interesting/v.cool if it works. Is it sustainable? (as in, just for the event, or forever-ish?)

Let us know if you want help on this.

-- Megan

On Fri, Jun 6, 2008 at 10:04 AM, Dylan Casey <dcasey@google.com> wrote:

Megan,



Marissa and I are leading Google's 10th birthday project and Larry mentioned the idea of giving the world, or internet dark spots, broadband internet access using blimps. Ironically an article in gizmodo mentioned it. Is there any truth to the article?

Thanks  
Dylan

<http://gizmodo.com/358940/google-may-buy-a-balloon-company-to-build-huge-wireless-networks>

## **EXHIBIT 20**

**REDACTED VERSION OF  
DOCUMENT SOUGHT TO BE  
SEALED**

**From:** "Minnie Ingersoll" <minnie@google.com>  
**To:** "Larry Alder" <lalder@google.com>, "Dylan Casey" <dcasey@google.com>, □ "Daniel Conrad" <dconrad@google.com>, □ "Mike Pearson" <pearson@google.com>, □ "Megan Smith" <megans@google.com>, □ "Sunil Daluvoy" <sunild@google.com>, □ "Jack Ancone" <ancone@google.com>, "David Lawee" <dlawee@google.com>  
**Sent:** Tue, 1 Jul 2008 13:01:16 -0700  
**Subject:** Re: Google's 10th bday

Dylan,

[REDACTED]

[REDACTED]

On Tue, Jul 1, 2008 at 10:26 AM, Larry Alder <lalder@google.com> wrote:

----- Forwarded message -----

**From:** Dylan Casey <dcasey@google.com>  
**Date:** Mon, Jun 30, 2008 at 6:23 PM  
**Subject:** Re: Google's 10th bday  
**To:** Larry Alder <lalder@google.com>  
**Cc:** Megan Smith <megans@google.com>, Mike Pearson <pearson@google.com>, Sunil Daluvoy <sunild@google.com>, Jack Ancone <ancone@google.com>, David Lawee <dlawee@google.com>

Hi Larry et al,

[REDACTED]

Can we meet to discuss the possibility of pulling this off?

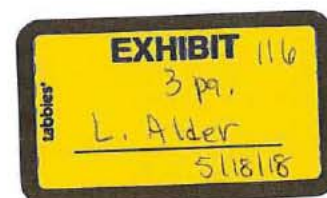
Thanks

Dylan

On Fri, Jun 6, 2008 at 10:44 AM, Dylan Casey <dcasey@google.com> wrote:

Larry...when did you all visit? [REDACTED]

On Fri, Jun 6, 2008 at 1:16 PM, Larry Alder <lalder@google.com> wrote:



Megan,

[REDACTED]

--Larry A.

On Fri, Jun 6, 2008 at 10:10 AM, Megan Smith <megans@google.com> wrote:

Dylan,

[REDACTED]

[REDACTED]

This is a pretty fun idea. A little crazy, but interesting/v.cool if it works. Is it sustainable? (as in, just for the event, or forever-ish?)

Let us know if you want help on this.

-- Megan

On Fri, Jun 6, 2008 at 10:04 AM, Dylan Casey <dcasey@google.com> wrote:

Megan,

Marissa and I are leading Google's 10th birthday project and Larry mentioned the idea of giving the world, or internet dark spots, broadband internet access using blimps. Ironically an article in gizmodo mentioned it. Is there any truth to the article?

Thanks

Dylan

<http://gizmodo.com/358940/google-may-buy-a-balloon-company-to-build-huge-wireless-networks>

--

Minnie Ingersoll | Product Manager | Google, Inc.  
cell 650-862-5098 | office 650-253-4575



## **EXHIBIT 21**

**REDACTED VERSION OF  
DOCUMENT SOUGHT TO BE  
SEALED**

UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF CALIFORNIA  
SAN JOSE DIVISION

---oO---

SPACE DATA CORPORATION, )  
)  
Plaintiff, )  
)  
vs. )  
) Case No.  
ALPHABET, INC., and GOOGLE, ) 5:16-cv-03260-BLF  
9 LLC, ) (NC)  
)  
10 Defendants. )  
)  
11 \_\_\_\_\_ )

\*\*\*CONFIDENTIAL - ATTORNEYS' EYES ONLY\*\*\*

VIDEOTAPED DEPOSITION OF ASTRO TELLER

June 13, 2018

JUVILYNN T. ARBUTHNOT, CSR No. 13817.  
439158



(310) 207-8000 Los Angeles  
(310) 207-8000 Century City  
(916) 922-5777 Sacramento  
(951) 686-0606 Riverside  
(212) 808-8500 New York City  
(312) 379-5566 Chicago

(415) 433-5777 San Francisco  
(408) 885-0550 San Jose  
(800) 222-1231 Martinez  
(818) 702-0202 Woodland Hills  
(347) 821-4611 Brooklyn  
00+1+800 222 1231 Paris

(949) 955-0400 Irvine  
(760) 322-2240 Palm Springs  
(702) 366-0500 Las Vegas  
(702) 366-0500 Henderson  
(518) 490-1910 Albany  
00+1+800 222 1231 Dubai

(858) 455-5444 San Diego  
(800) 222-1231 Carlsbad  
(800) 222-1231 Monterey  
(516) 277-9494 Garden City  
(914) 510-9110 White Plains  
001+1+800 222 1231 Hong Kong

UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF CALIFORNIA  
SAN JOSE DIVISION

---oOo---

SPACE DATA CORPORATION,	)	
	)	
Plaintiff,	)	
	)	
vs.	)	
	)	Case No.
ALPHABET, INC., and GOOGLE,	)	5:16-cv-03260-BLF
LLC,	)	(NC)
	)	
Defendants.	)	
	)	
	)	

\*\*\*CONFIDENTIAL - ATTORNEYS' EYES ONLY\*\*\*

VIDEOTAPED DEPOSITION OF ASTRO TELLER,  
taken on behalf of the Plaintiff, at Hosie Rice, LLP, 600  
Montgomery Street, 34th Floor, San Francisco, California,  
commencing at 12:02 p.m., on Wednesday, June 13, 2018,  
before JUVILYNN T. ARBUTHNOT, Certified Shorthand  
Reporter No. 13817.

1 BY MR. HOSIE:

2 Q Let me show you what's been marked as our next  
3 in order, Exhibit 246.

4 (Deposition Exhibit 246 was marked  
12:20 5 for identification and attached  
6 hereto.)

7 BY MR. HOSIE:

8 Q I know you're a doctor, but I don't stand on  
9 formality, so I'm going to call you "Mr. Teller." Is  
12:21 10 that okay by you, sir?

11 A Sure.

12 Q And you don't have to call me "Attorney Hosie"  
13 either.

14 A Deal.

12:21 15 Q Deal.

16 I've marked our next in order Exhibit 246. I  
17 can tell you this document was created December 12th,  
18 2009, and Sebastian Thrun is its author. I'm going to  
19 ask you only about the "high-altitude Internet backbone  
12:21 20 sentence" on the first page.

21 MR. WERDEGAR: And you're welcome to take as  
22 much time as you need to look at the document.

23 THE WITNESS: Okay. Well, I can see the line  
24 you're referring to.

12:21 25 BY MR. HOSIE:

1 Q Right. And my question, sir: Have you ever  
2 seen this document before?

3 A Certainly not in its current format.

4 Q With all the redactions?

12:21 5 A I remember a document that this could easily be  
6 a redacted version of.

7 Q Okay.

8 A It's a little hard to tell from this, but  
9 it's -- it's -- there was a long list of ideas that we  
12:22 10 kept at X, and I can believe that this was some early  
11 version of that document that was then redacted, but I  
12 can't tell you from looking at this whether that's true  
13 or not.

14 Q Fair enough. Was there a name for this list of  
12:22 15 interesting projects at X?

16 A You know, there was more than one list, but we

17 [REDACTED]

18 [REDACTED]

19 [REDACTED]

20 [REDACTED]

21 [REDACTED]

22 [REDACTED]

23 A To get ideas on paper, mostly.

24 Q Do you know who Thomas Zurbuchen is?

12:22 25 Z-u-r-b-r-u-c-h-e-n [sic]?



1 A Yes. I believe it was late June of 2011.

2 Q Okay. Long after the fall of 2010?

3 A That's how the calendar functions. Yes.

4 Q Thank you. This is a funny business, sir. It's

12:32 5 important that we --

6 A That's all right. That's all right.

7 Q You gotta --

8 A I'm just -- I'm not sure how to answer --

9 Q No. You're doing fine. You're doing fine.

12:33 10 Let me show you what has been marked as

11 Exhibit 250.

12 (Deposition Exhibit 250 was marked

13 for identification and attached

14 hereto.)

15 THE WITNESS: Okay.

16 BY MR. HOSIE:

17 Q Was this shown to you by your lawyers in your  
18 prep session?

19 A No.

12:33 20 Q Do you recognize it?

21 A No.

22 Q Do you know who Johnny Lee is?

23 A Yes.

24 Q What was Johnny Lee's position at Apple in the  
12:33 25 spring of 2011, please?



1 Q Do you know, was he the progenitor of this  
2 meeting, one way or the other?

3 MR. WERDEGAR: Objection. Lacks foundation.

4 THE WITNESS: I just don't remember, but it's  
12:40 5 possible.

6 BY MR. HOSIE:

7 Q All right, sir. And so tell me, as you recall,  
8 how it was that Mr. DeVaul started working on balloons  
9 within two weeks of joining Google as an employee.

12:40 10 A There's so many different things there. Can  
11 you, like, give me a more narrow question, like --

12 Q Yeah. So DeVaul joins Rapid Eval at X very late  
13 June 2011; correct so far?

14 A Yes.

12:40 [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

12:40 20 Q So how was it that DeVaul became interested in  
21 working on balloons within his first two weeks at Google?

22 MR. WERDEGAR: Objection. Lacks foundation.

23 BY MR. HOSIE:

24 Q If you know.

12:41 25 MR. WERDEGAR: Calls for a narrative.



1 THE WITNESS: He was hired into a rapid  
2 evaluation team. There were hundreds of ideas floating  
3 around the building. His entire job was to go picking  
4 through those ideas, trying to throw them out. He

12:41

5 [REDACTED]  
6 some idea floating around the building. This doesn't  
7 seem at all remarkable to me.

8 BY MR. HOSIE:

9 [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

12 Q Yeah. And so the idea of balloon-borne Internet  
13 was percolating at X before DeVaul joined you; fair?

14 MR. WERDEGAR: Objection. Asked and answered.  
12:41 15 Vague.

16 THE WITNESS: Now that you have refreshed me  
17 with these particular e-mails, I see that that's the  
18 case.

19 BY MR. HOSIE:

12:41

20 Q Fair enough. And so your best sense of it now  
21 is that DeVaul talked to someone or heard something, and  
22 that got him sparked on the balloon stuff --

23 MR. WERDEGAR: Objection.

24 BY MR. HOSIE:

12:41

25 Q -- within two weeks of his joining Rapid Eval?

1 MR. WERDEGAR: Lacks foundation. Calls for  
2 speculation.

3 THE WITNESS: That's not exactly how I would put  
4 it. My memory is that I talked to Rich about many of  
12:42 5 these ideas, and when I mentioned that there was some  
6 receptivity to certain ideas, like balloon-powered  
7 Internet, Rich said, "Oh, I've been thinking about that  
8 for a decade or more."

9 BY MR. HOSIE:

12:42 10 Q Got it.

11 A So --

12 Q So that's what you recall?

13 A Yes.

14 MR. WERDEGAR: Let the witness finish, please.

12:42 15 THE WITNESS: So whether that fact that he had  
16 been thinking about it for a decade or more and that  
17 there was some incremental receptivity from Larry was  
18 what caused him to call this meeting -- that, I can't  
19 tell you.

12:42 20 BY MR. HOSIE:

21 [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

1 DEPOSITION OFFICER'S CERTIFICATE

2 STATE OF CALIFORNIA )  
 ) ss.  
 3 COUNTY OF MARIN )

4  
 5  
 6 I, JUVILYNN T. ARBUTHNOT, hereby certify:

7 I am a duly qualified Certified Shorthand  
 8 Reporter in the State of California, holder of  
 9 Certificate Number 13817 issued by the Court Reporters  
 10 Board of California and which is in full force and  
 11 effect. (Fed. R. Civ. P. 28(a)).

12 I am authorized to administer oaths or  
 13 affirmations pursuant to California Code of Civil  
 14 Procedure, Section 2093(b) and prior to being examined,  
 15 the witness was first duly sworn by me. (Fed. R. Civ. P.  
 16 28(a), 30(f)(1)).

17 I am not a relative or employee or attorney or  
 18 counsel of any of the parties, nor am I a relative or  
 19 employee of such attorney or counsel, nor am I  
 20 financially interested in this action. (Fed. R. Civ. P.  
 21 28).

22 I am the deposition officer that  
 23 stenographically recorded the testimony in the foregoing  
 24 deposition and the foregoing transcript is a true record  
 25 of the testimony given by the witness. (Fed. R. Civ. P.

1 30(f)(1)).

2 Before the completion of the deposition, review  
3 of the transcript [XX] was [ ] was not requested. If  
4 requested, any changes made by the deponent (and provided  
5 to the reporter) during the period allowed, are appended  
6 hereto. (Fed. R. Civ. P. 30(e)).

7 Dated: June 29, 2018.

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## **EXHIBIT 22**

**REDACTED VERSION OF  
DOCUMENT SOUGHT TO BE  
SEALED**



IN THE UNITED STATES DISTRICT COURT  
 FOR THE NORTHERN DISTRICT OF CALIFORNIA  
 SAN JOSE DIVISION

SPACE DATA CORPORATION, )  
 )  
 Plaintiff, )  
 )  
 v. ) No. 5:16-cv-03260-BLF  
 )  
 X, ALPHABET INC., and GOOGLE )  
 INC., )  
 )  
 Defendants. )

---

C O N F I D E N T I A L

DEPOSITION of RICHARD DEVAUL

July 19, 2017

Reported by: Karen Moon, CSR No. 12450  
 426654



(310) 207-8000 Los Angeles  
 (310) 207-8000 Century City  
 (916) 922-5777 Sacramento  
 (951) 686-0606 Riverside  
 (212) 808-8500 New York City  
 (312) 379-5566 Chicago

(415) 433-5777 San Francisco  
 (408) 885-0550 San Jose  
 (800) 222-1231 Martinez  
 (818) 702-0202 Woodland Hills  
 (347) 821-4611 Brooklyn  
 00+1+800 222 1231 Paris

(949) 955-0400 Irvine  
 (760) 322-2240 Palm Springs  
 (702) 366-0500 Las Vegas  
 (702) 366-0500 Henderson  
 (518) 490-1910 Albany  
 00+1+800 222 1231 Dubai

(858) 455-5444 San Diego  
 (800) 222-1231 Carlsbad  
 (800) 222-1231 Monterey  
 (516) 277-9494 Garden City  
 (914) 510-9110 White Plains  
 001+1+800 222 1231 Hong Kong

IN THE UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF CALIFORNIA  
SAN JOSE DIVISION

SPACE DATA CORPORATION, )  
 )  
Plaintiff, )  
 )  
v. ) No. 5:16-cv-03260-BLF  
 )  
X, ALPHABET INC., and GOOGLE )  
INC., )  
 )  
Defendants. )  
\_\_\_\_\_ )

C O N F I D E N T I A L

Deposition of RICHARD DEVAUL, taken  
on behalf of the Plaintiff, at  
600 Montgomery Street, 34th Floor,  
San Francisco, California, commencing  
at 10:03 a.m., Wednesday, July 19, 2017,  
before Karen Moon, Certified Shorthand  
Reporter No. 12450.

10:04:50 1 Q You currently work on Project Loon at Google;  
10:04:54 2 do you not, sir?

10:04:55 3 A I do not.

10:04:56 4 Q When did you stop?

10:04:59 5 A I transferred off of Loon in late June of  
10:05:03 6 2013.

10:05:04 7 Q Were you replaced by someone?

10:05:07 8 MR. KAMBER: Objection. Vague.

10:05:11 9 THE WITNESS: I was succeeded in the  
10:05:13 10 leadership of Loon by Mike Cassidy.

10:05:18 11 BY MR. HOSIE

10:05:18 12 Q And then Mike Cassidy had that job for what,  
10:05:21 13 six, seven months?

10:05:23 14 MR. KAMBER: Objection. Assumes facts not in  
10:05:23 15 evidence.

10:05:27 16 THE WITNESS: Mike Cassidy was the principal  
10:05:29 17 leader of Loon for, as far as I recall, another two  
10:05:35 18 years or so.

10:05:35 19 BY MR. HOSIE

10:05:36 20 Q Great. Who replaced Mr. Cassidy?

10:05:41 21 A The -- Mike Cassidy was I would say not  
10:05:43 22 replaced. He was joined by a man named Tom Moore.

10:05:50 23 Q You joined Google circa the summer of 2011?

10:05:56 24 A I joined Google on -- mid-June of 2011.  
10:06:00 25 That's correct.



10:06:02 1 Q You came from Apple?

10:06:04 2 A Yes.

10:06:05 3 Q How did you come to join Google, sir?

10:06:11 4 A I was recruited by Astro Teller.

10:06:19 5 Q Astro, that refers to a haircut he had in high  
10:06:23 6 school; does it not, sir?

10:06:25 7 A I actually don't know.

10:06:27 8 Q And how did you know Astro Teller?

10:06:31 9 A I did not.

10:06:33 10 Q So how did he come to find you, as you  
10:06:35 11 understood it?

10:06:38 12 A As I understood it, Astro found me because he  
10:06:41 13 was aware of my work in graduate school.

10:06:45 14 Q And graduate school was MIT?

10:06:48 15 A Yes. That was the second graduate school that  
10:06:50 16 I attended.

10:06:51 17 Q And what was your work in graduate school that  
10:06:54 18 attracted Mr. Teller's interest?

10:06:58 19 MR. KAMBER: Objection. Foundation.

10:07:02 20 THE WITNESS: I don't know for sure.

10:07:03 21 BY MR. HOSIE

10:07:03 22 Q What did he tell you?

10:07:07 23 MR. KAMBER: Objection. Foundation. Assumes  
10:07:08 24 facts not in evidence.

10:07:10 25 THE WITNESS: Astro never actually told me why

10:20:53 1 BY MR. HOSIE

10:20:53 2 Q You've never seen a Google org chart?

10:20:57 3 A I have never seen a Google org chart.

10:21:05 4 Q So there are four members of rapid evaluation,  
10:21:08 5 and you guys have part of the space that's shared by  
10:21:12 6 Google X as of 2011; correct?

10:21:17 7 A That would have been true as of July,  
10:21:21 8 August 2011.

10:21:24 9 Q Okay. And then did you start adding members  
10:21:26 10 to rapid evaluation?

10:21:28 11 A Yes.

10:21:37 12 Q Who did you add, please?

10:21:38 13 A I'm trying to remember who the next hire was.  
10:21:44 14 Dan Monzy joined us for some period of time. I'm trying  
10:21:59 15 to remember who the next hire was after Dan.

10:22:16 16 I don't recall who the next hire was after  
10:22:19 17 Dan. We had an intern. Oh, what was his name. A  
10:22:29 18 professor who was working on game-ification of things.  
10:22:38 19 He had founded Foldit, the protein-folding collective  
10:22:43 20 crowd-sourced thing. He joined us for some period of  
10:22:47 21 time. His name will probably come to me.

10:22:52 22 Q All right, sir. And so what were you  
10:22:55 23 personally asked to do when you joined the rapid  
10:22:59 24 evaluation team in June of 2011?

10:23:05 25 A I was asked to come up with big, potentially

10:23:10 1 world-changing opportunities for Google X.

10:23:13 2 Q And you said some of these big, potential  
10:23:17 3 world-changing opportunities were suggested by other  
10:23:21 4 members of Google X, not just the rapid evaluation team;  
10:23:24 5 right?

10:23:26 6 A That's true.

10:23:26 7 Q Okay. And is it not true that Larry Page  
10:23:31 8 through Astro Teller asked you to think about a  
10:23:34 9 balloon-borne internet constellation?

10:23:39 10 A No.

10:23:39 11 Q Who asked you to think about that, sir?

10:23:41 12 A Nobody asked me to think about that.

10:23:43 13 Q So you just came up with the idea on your own?

10:23:45 14 A Yes.

10:23:46 15 Q Where did you get the idea from?

10:23:51 16 A There is a very long history of using balloons  
10:23:54 17 for communication. I first considered that when I was  
10:23:58 18 working at the MIT Media Lab, probably circa '99, 2000.

10:24:09 19 Q Did you do any writing on that then?

10:24:14 20 A I don't have any publications on that. It was  
10:24:17 21 an idea I discussed with my adviser.

10:24:20 22 Q Who was your adviser?

10:24:22 23 A Alex Pentland.

10:24:26 24 Q And so it just sort of marinated in your mind  
10:24:31 25 from graduate school forward?



10:24:35 1 MR. KAMBER: Objection. Vague.

10:24:37 2 BY MR. HOSIE

10:24:37 3 Q Are you confused by that question, sir? It's  
10:24:41 4 colorful, but I'm not sure it's confusing.

10:24:45 5 A It was certainly not something I was actively  
10:24:47 6 thinking about for a long time, but it was obviously  
10:24:50 7 something I'd considered.

10:24:52 8 Q Okay. And so you're hired. Astro Teller  
10:24:58 9 says, Rich, come up with the next big world-changing  
10:25:02 10 idea, and then you say here's one, how about a balloon  
10:25:05 11 internet constellation? Is that how it happened?

10:25:08 12 A No.

10:25:09 13 Q How did it happen?

10:25:14 14 A I'm sorry. Are you asking about the origin of  
10:25:17 15 balloon concept or project?

10:25:19 16 Q I'm asking about how you personally came up  
10:25:22 17 with Loon and described it to your boss Astro Teller in  
10:25:26 18 the summer of 2011.

10:25:28 19 MR. KAMBER: Objection. Lacks foundation.  
10:25:29 20 Assumes facts not in evidence.

10:25:36 21 [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

10:26:03 1

10:26:03 2

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10:26:03 4

10:26:03 5

10:26:03 6

10:26:26 7 BY MR. HOSIE

10:26:26 8 Q All right. Wasn't there a group at Google in

10:26:29 9 2011 already working on the connectivity problem?

10:26:33 10 MR. KAMBER: Objection. Vague.

10:26:38 11 THE WITNESS: I was not aware of any other

10:26:40 12 group at Google working on global connectivity for the

10:26:49 13 folks who could not afford connectivity at that time.

10:26:54 14 BY MR. HOSIE

10:26:54 15 Q Thank you. Not quite my question.

10:26:56 16 Wasn't there another group at Google working

10:26:58 17 on the connectivity problem? E.g. fiber, e.g. fixed

10:27:02 18 wing drones --

10:27:12 19 MR. HOSIE: If I may finish, counsel. That's

10:27:14 20 why the reporter's having a problem. Please let me

10:27:16 21 finish my question before you interject.

10:27:20 22 BY MR. HOSIE

10:27:20 23 Q That being the project that eventually became

10:27:23 24 Titan?

10:27:24 25 MR. KAMBER: Objection. Misstates prior

10:29:02 1 A I don't know where it was located in June-ish  
10:29:07 2 of 2011. Eventually many offices moved, and we ended up  
10:29:15 3 not too far away from them later on in a year or two.

10:29:19 4 Q And by not too far away, what do you mean?

10:29:24 5 A There was a one-mile jogging path that circled  
10:29:27 6 around a wetland, and it turns out that the Access and  
10:29:32 7 Energy office, once Craig Barratt took over, was located  
10:29:37 8 on the other side of that jogging path.

10:29:41 9 Q Did you know any of the folks working at the  
10:29:45 10 Access group in the fall of 2011?

10:29:48 11 A No.

10:29:48 12 Q Did you ever meet them?

10:29:50 13 MR. KAMBER: Objection. Vague.

10:29:54 14 THE WITNESS: Not to my knowledge.

10:29:55 15 BY MR. HOSIE

10:29:56 16 Q All right, sir. So as I understand the  
10:30:00 17 evolution of what became Loon, you had done some  
10:30:04 18 thinking about this as a graduate student. You first

10:30:06 19

██████████

██████████

██████████

██████████

10:30:21 24 Fair summary?

10:30:22 25 A That's a fair summary.



10:30:23 1 Q Okay. And so you go back to your space and  
10:30:27 2 you start to think about connectivity?

10:30:31 3 A Yes.

10:30:32 4 Q Okay. And it's pretty quickly apparent that  
10:30:36 5 terrestrial infrastructure is not going to work to solve  
10:30:40 6 that problem; right?

10:30:41 7 A Yes.

10:30:42 8 Q Right. Because it's not economic?

10:30:44 9 MR. KAMBER: Objection. Vague. Misstates  
10:30:47 10 prior testimony.

10:30:49 11 THE WITNESS: Yes. Connectivity is a  
10:30:54 12 important and valuable resource. And if it can be  
10:31:00 13 deployed terrestrially most places, it already has been.

10:31:04 14 BY MR. HOSIE

10:31:05 15 Q Hundred percent. That which can be built  
10:31:08 16 easily and cheaply has been built; correct?

10:31:12 17 MR. KAMBER: Objection. Vague. Foundation.

10:31:14 18 THE WITNESS: In terms of connectivity, if  
10:31:16 19 there is a low-cost conventional solution for  
10:31:19 20 connectivity that is cost-effective, it has most likely  
10:31:23 21 been deployed.

10:31:25 22 BY MR. HOSIE

10:31:25 23 Q I think that's right. Okay. So that prompts  
10:31:28 24 you to think in more unconventional ways.

10:31:33 25 Fair?

10:31:34 1 A Yes.

10:31:35 2 Q Looking for something new, something  
10:31:37 3 different.

10:31:38 4 Also fair?

10:31:39 5 MR. KAMBER: Objection. Vague.

10:31:42 6 THE WITNESS: I was looking for innovative  
10:31:45 7 solutions that might combine new or old elements,  
10:31:49 8 essentially anything that I thought could really  
10:31:52 9 meaningfully impact that problem.

10:31:54 10 BY MR. HOSIE

10:31:55 11 Q In a way that would be new and different?

10:31:58 12 MR. KAMBER: Objection. Vague. Asked and  
10:31:59 13 answered.

10:32:03 14 THE WITNESS: We were by definition looking  
10:32:05 15 for novel opportunities.

10:32:09 16 BY MR. HOSIE

10:32:09 17 Q In fact, that was your charter. Come up with  
10:32:12 18 new, novel, earth-changing ideas. That was your whole  
10:32:15 19 deal in the rapid evaluation; correct?

10:32:20 20 MR. KAMBER: Objection. Compound. Vague.  
10:32:22 21 Assumes facts not in evidence.

10:32:27 22 THE WITNESS: I would say that we were -- our  
10:32:29 23 mission was to create new opportunities, and those  
10:32:35 24 opportunities would have at their core enabling  
10:32:38 25 technology. Generally speaking, that would be some



10:32:43 1 pretty radical technology.

10:32:48 2 BY MR. HOSIE

10:32:49 3 Q Okay. And what became Loon struck you  
10:32:54 4 personally as a pretty radical technology?

10:33:00 5 A No.

10:33:01 6 Q It didn't strike you as a really cool new  
10:33:03 7 idea?

10:33:08 8 A Loon struck me as a opportunity enabled by  
10:33:16 9 insight into the nature of the problem and utilizing  
10:33:24 10 many existing components, but combined in a new way that  
10:33:28 11 would potentially allow us to tackle the connectivity  
10:33:33 12 problem at scale.

10:33:37 13 Q And you were excited about this idea?

10:33:43 14 A I was pretty excited about Loon. That's  
10:33:45 15 right.

10:33:46 16 Q In fact, I think you wrote on your personal  
10:33:48 17 website how new and cool it was in 2013. Did you not,  
10:33:52 18 sir?

10:33:56 19 MR. KAMBER: Objection. Vague. Hearsay.

10:33:59 20 THE WITNESS: I don't specifically recall the  
10:34:01 21 date, but certainly once we announced Loon I posted  
10:34:04 22 about how excited I was. That's right.

10:34:06 23 BY MR. HOSIE

10:34:07 24 Q Why were you excited?

10:34:12 25 A I was excited, because I felt like we had the

DEPOSITION OFFICER'S CERTIFICATE

STATE OF CALIFORNIA       )  
  )     ss.  
COUNTY OF ALAMEDA       )

I, Karen Moon, hereby certify:

I am a duly qualified Certified Shorthand Reporter in the State of California, holder of Certificate Number CSR 12450 issued by the Court Reporters Board of California and which is in full force and effect. (Fed. R. Civ. P. 28(a)).

I am authorized to administer oaths or affirmations pursuant to California Code of Civil Procedure, Section 2093(b) and prior to being examined, the deponent was first duly sworn by me. (Fed. R. Civ. P. 28(a), 30(f)(1)).

I am not a relative or employee or attorney or counsel of any of the parties, nor am I a relative or employee of such attorney or counsel, nor am I financially interested in this action. (Fed. R. Civ. P. 28).

I am the deposition officer that stenographically recorded the testimony in the foregoing deposition and the foregoing transcript is a true record of the testimony given by the witness.

1 (Fed. R. Civ. P. 30(f)(1)).

2 Before completion of the deposition,  
3 review of the transcript [ XX ] was [ ] was not  
4 requested. If requested, any changes made by the  
5 deponent (and provided to the reporter) during the  
6 period allowed are appended hereto. (Fed. R. Civ. P.  
7 30(e)).

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Dated: August 1, 2017

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A handwritten signature in black ink, appearing to be "K. A. [unclear]", written over a horizontal line.

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## **EXHIBIT 27**

**REDACTED VERSION OF  
DOCUMENT SOUGHT TO BE  
SEALED**

Detailed description

Key people

Importance Status

Mobile sensor interfaces

REDACTED - SBI/NR

High-altitude Internet backbone

Deploy balloons (or similar) to create airborne Internet backbone

Energy

REDACTED - SBI/NR







REDACTED - SBI/NR

Medical

REDACTED - SBI/NR

Transportation

REDACTED - SBI/NR

Robotics

REDACTED - SBI/NR

Radical Software Ideas

[REDACTED]



REDACTED - SBI/NR



## **EXHIBIT 34**

**REDACTED VERSION OF  
DOCUMENT SOUGHT TO BE  
SEALED**

From: Sebastian Thrun <thrun@google.com>  
To: Astro Teller <astroteller@google.com>  
Sent: Mon, 15 Nov 2010 22:46:31 -0800  
Subject: Fwd: quick question

----- Forwarded message -----  
From: **L a r r y P a g e** <page@google.com>  
Date: Mon, Nov 15, 2010 at 10:40 PM  
Subject: Re: quick question  
To: Sebastian Thrun <thrun@google.com>

OK

check out: [http://www.spacedata.net/documents/SkySite\\_Telemetry\\_Overview\\_Jan06.pdf](http://www.spacedata.net/documents/SkySite_Telemetry_Overview_Jan06.pdf)  
Sergey and I launched one of these ourselves.

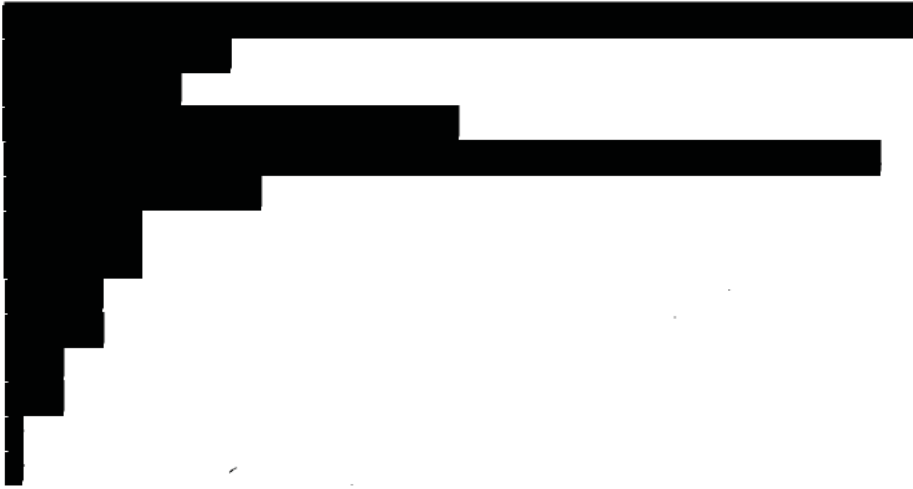
-Larry

On Mon, Nov 15, 2010 at 10:38 PM, Sebastian Thrun <thrun@google.com> wrote:

[REDACTED]



[REDACTED]



## **EXHIBIT 38**

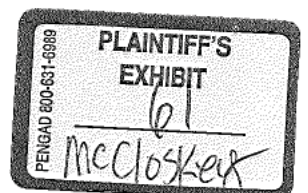
**REDACTED VERSION OF  
DOCUMENT SOUGHT TO BE  
SEALED**

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]





# Space Data Corporation

*The Leader in Near-Space Wireless*

“SkySites = 700 MHz Bid Advantage”

November, 2007

Jerry Knoblach, CEO & Co-Founder  
Eric Frische, CTO & Co-Founder  
Jim Wiesenber, CSO  
[www.spacedata.net](http://www.spacedata.net)



## **Advantages of Space Data for Google**

- Expand current M2M/SMS network to national SMS on our 900 MHz spectrum
- Nationwide PTT voice / SMS over Space Data's 900 MHz spectrum
- 100% coverage from Day 1 (Feb. 2009) of 700 MHz C + D blocks
- 3<sup>rd</sup> network layer for lower latency, higher capacity vs. ATC alone
- Licensed supervisory / firmware update channel for TV White Space
- Our 900 MHz spectrum is within int'l GSM band = inexpensive devices
- SkySite Patent approved in 42 countries
- Rapid deployment of ubiquitous wireless networks (protocol / freq. agnostic)
- High resolution imagery for Google Earth content





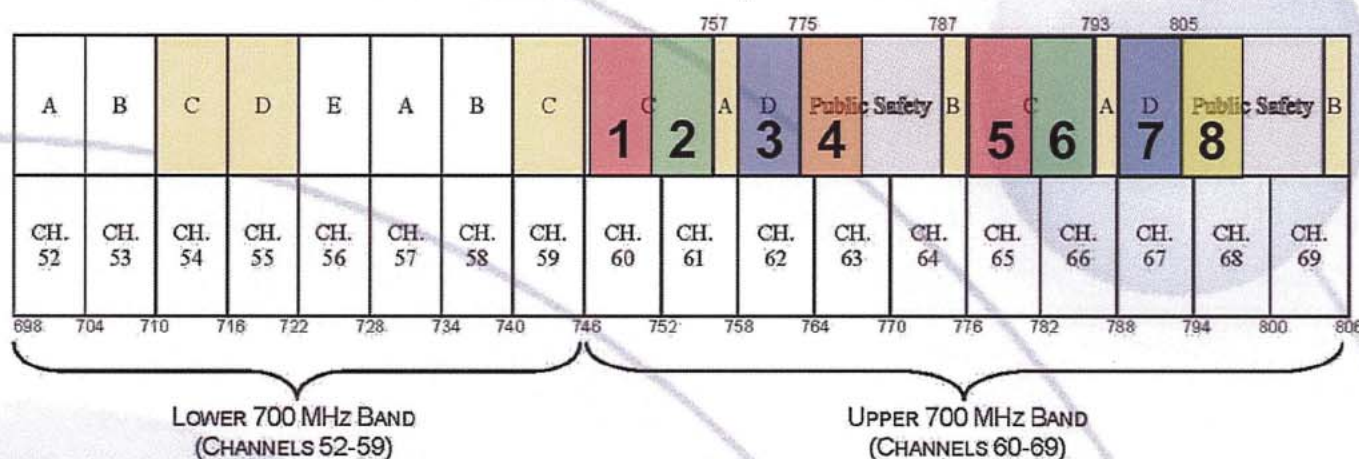
## Advantages of Space Data for 700 MHz Licensees

- Improved rollout strategy
  - Ubiquity from SkySite® overlay from beginning
    - Transparent to consumer (no special device needed)
  - Fill in areas with towers as demand increases
  - First 100% coverage from any carrier
    - Poor coverage key component of customer satisfaction and thus churn rates
- Inexpensive method to meet FCC build out requirements
  - 70% geography. on A, B & E blocks
    - vs. 75% pops (about 10% geo.) for PCS auctioned in 1990s
  - 99.3% pop on Block D
    - \$5B more than 75% pop build out if towers are used
    - Makes need for dual mode satellite device less significant
  - C block – REAG are large geographic markets which fit SkySite technology well
- Nearly \$200 M in Bidding Credits available through the FCC's Tribal Land Bidding Credit Program
  - Space Data has successfully used this program on 4 auctions
- Wireless Technology agnostic – CDMA / WCDMA / WiMAX



## Bandplan for 700 MHz

- Assume operator has access to C & D Block + 20 MHz of Public Safety
  - 42 MHz broken into eight 5 MHz WiMAX TDD channels
  - Allows 6 ch. for reuse of 3 on SkySites & Towers + 2 fringe/core ch.



Block	Frequencies	Bandwidth	Pairing	Area Type	Licenses
A	698-704, 728-734	12 MHz	2 x 6 MHz	EA	176
B	704-710, 734-740	12 MHz	2 x 6 MHz	CMA	734
C	710-716, 740-746	12 MHz	2 x 6 MHz	CMA	734*
D	716-722	6 MHz	unpaired	EAG	6*
E	722-728	6 MHz	unpaired	EA	176
C	746-757, 776-787	22 MHz	2 x 11 MHz	REAG	12
D	758-763, 788-793	10 MHz	2 x 5 MHz	Nationwide	1**
A	757-758, 787-788	2 MHz	2 x 1 MHz	MEA	52***
B	775-776, 805-806	2 MHz	2 x 1 MHz	MEA	52***

Space Data<sup>®</sup>  
CORPORATION



## Three Sectors Per SkySite Platform

- WiMAX SkySite is despun, gravity gradient stabilized and has 3 sectors
  - These use the Red, Green, and Blue channels (2 per sector)
  - Switches to Fringe ch. if overlap with towers (Yellow and Orange)
  - Can turn off sector over urban cores and suburbs with towers
- Suburban towers use same Red, Green, Blue ch. (2 per sector)
- Urban Cores can use all 8 channels due to higher urban signal levels
  - Building penetration in urban areas is 19 dB vs. 6 dB in rural areas

SkySite Sectors Use  
Orange or Yellow Ch.  
When over towers

Suburban  
Towers

Urban  
Core

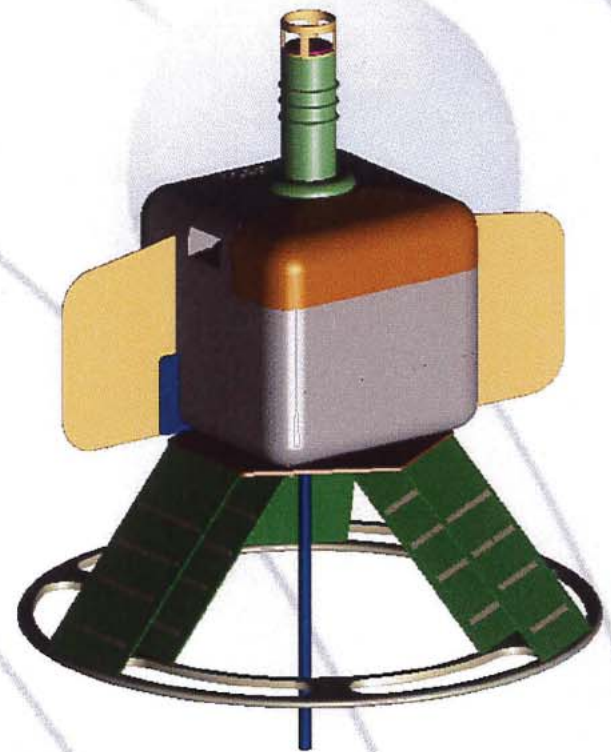
Higher Power overcomes  
any SkySite Interference

Single WiMAX  
SkySite Coverage  
with 3 sectors



## WiMAX SkySite® Platform

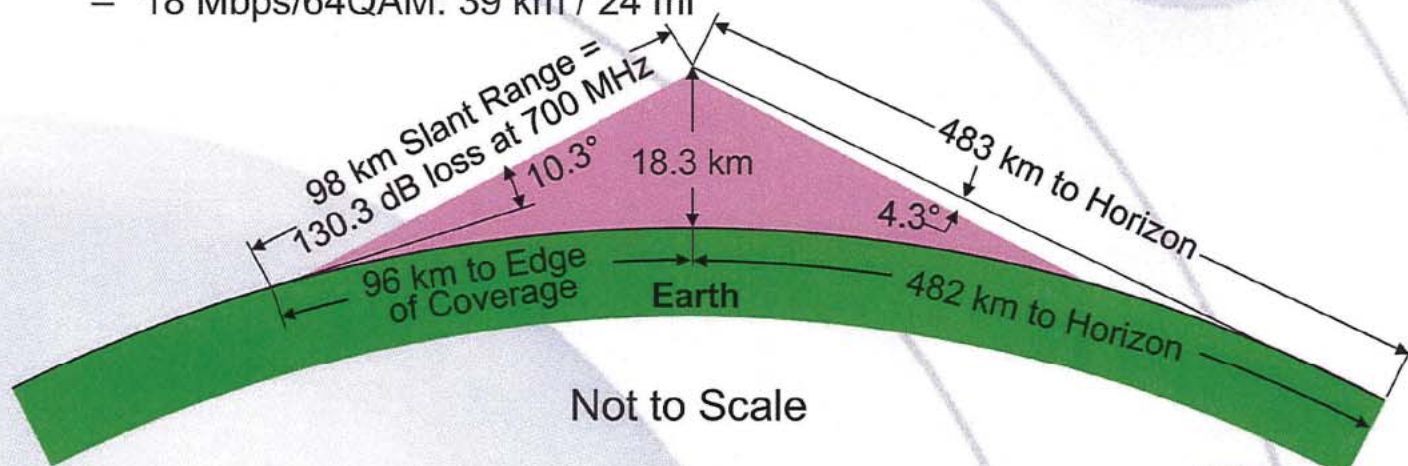
- Float altitude of 60,000 feet powered by combination of solar and fuel cell
- Fuel cell is powered by hydrogen taken from lifting gas and oxygen from hanging balloon or atmosphere
- Payload vents lifting gas and drops ballast to maintain altitude
- Payload target weight is under 12 pounds (FAA does not include H<sub>2</sub> or O<sub>2</sub> balloon systems)
- Antenna system consists of 3 thin-film, broadside Yagi antennas





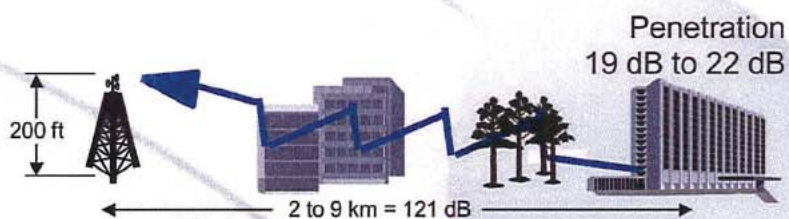
## WiMAX SkySite Coverage Geometry

- Coverage Circle size limited by link budget and capacity considerations
  - Link budget compensated by gain of antenna, LNA, PA at SkySite
  - WiMAX provides adequate time advance for long path lengths
- Minimum elevation angle is 10.3 degrees
  - Equivalent to standing 0.2 miles from a 200 foot tower (i.e. little fading)
- At 60,000 feet (18.3 km) the following link distances can be achieved
  - 6Mbps/QPSK: 96 km / 60 mi
  - 12Mbps/16QAM: 76 km / 47 mi
  - 18 Mbps/64QAM: 39 km / 24 mi



## Longer RF Link But Same Path Loss

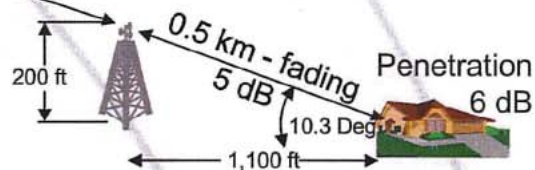
- Terrestrial systems have to power through clutter
  - 141 dB path loss



- Two path loss regions:
    - 42 mi free space path: -130 dB
    - Local fading path + penetration: - 11 dB
- 141 dB path loss

98 km - Free Space Loss ( $1/R^2$ ) = 130 dB

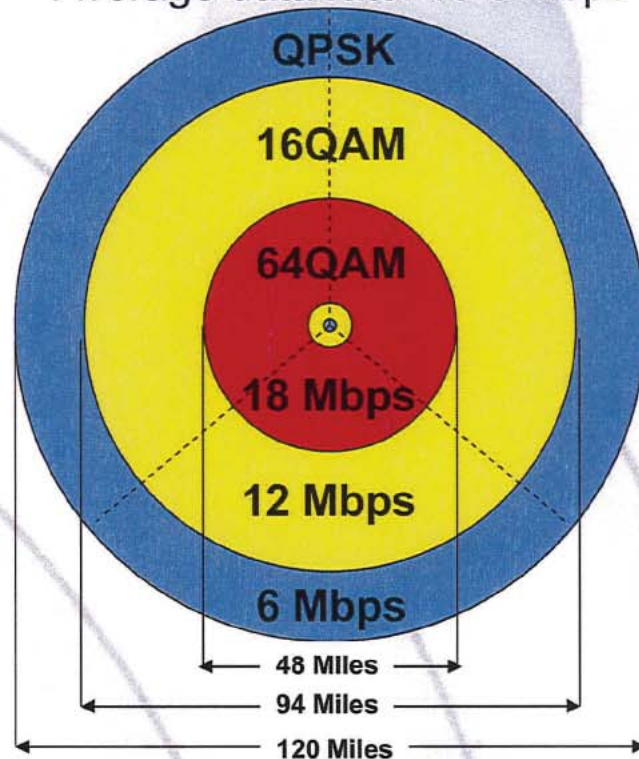
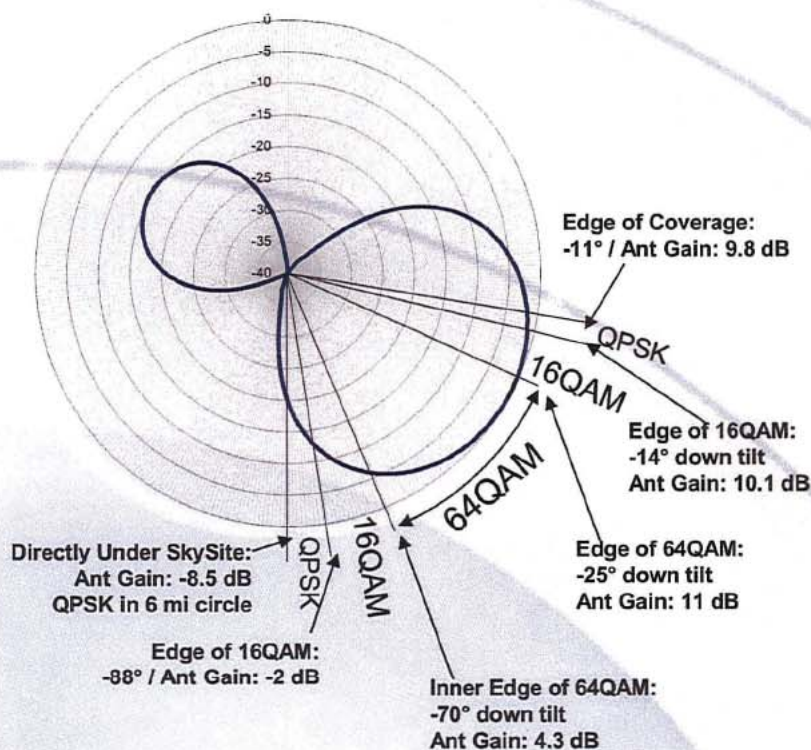
- Gains vs. Terrestrial Link:
  - Less penetration loss for rural bldgs.
  - Noise free environment
  - Cold LNA at antenna
  - Lower dynamic range allows for more LNA gain





## WiMAX SkySite Antenna and Data Rates

- Antenna pattern for a 11.1 dBi Yagi
  - Downtilt = 30°
- Coverage Circle size limited by link budget and capacity
  - Average data rate: 10.6 Mbps

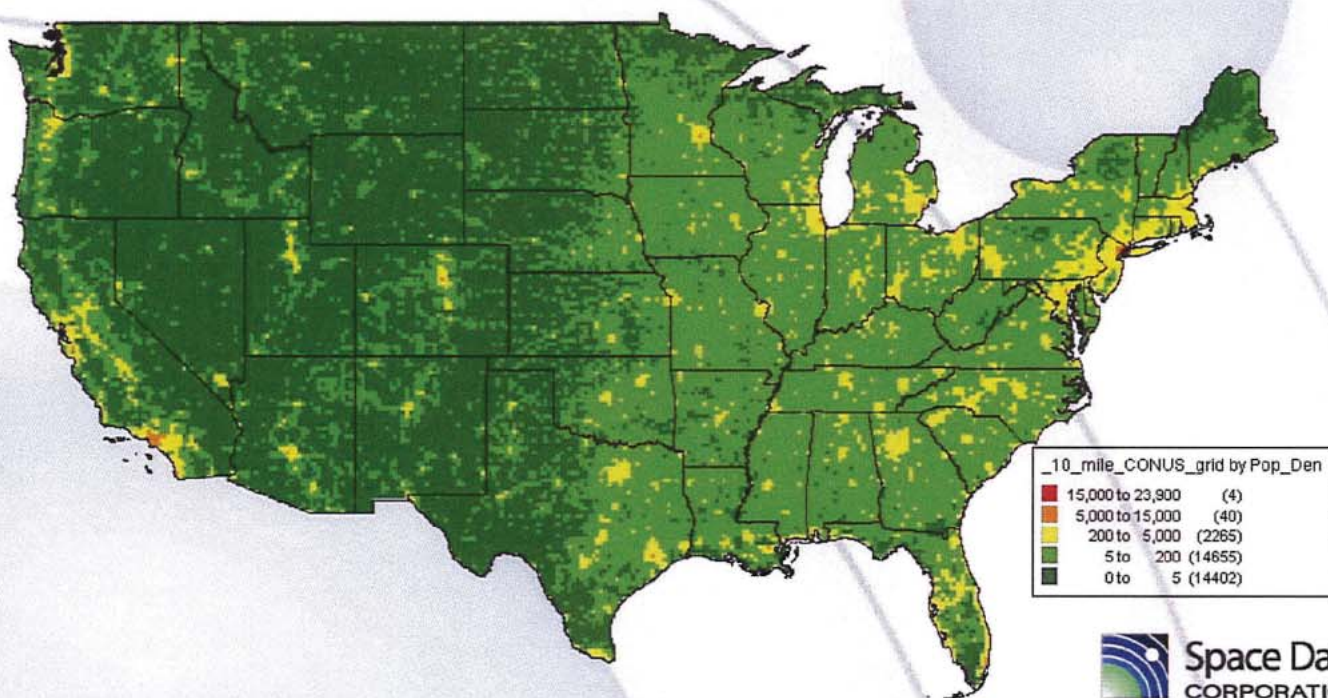


Note: Pattern is for commercially available antenna (Andrew DB498-PS)  
Antenna optimized for SkySites would result in higher avg. data rates



## Population Density Map – 10x10 mi Grid

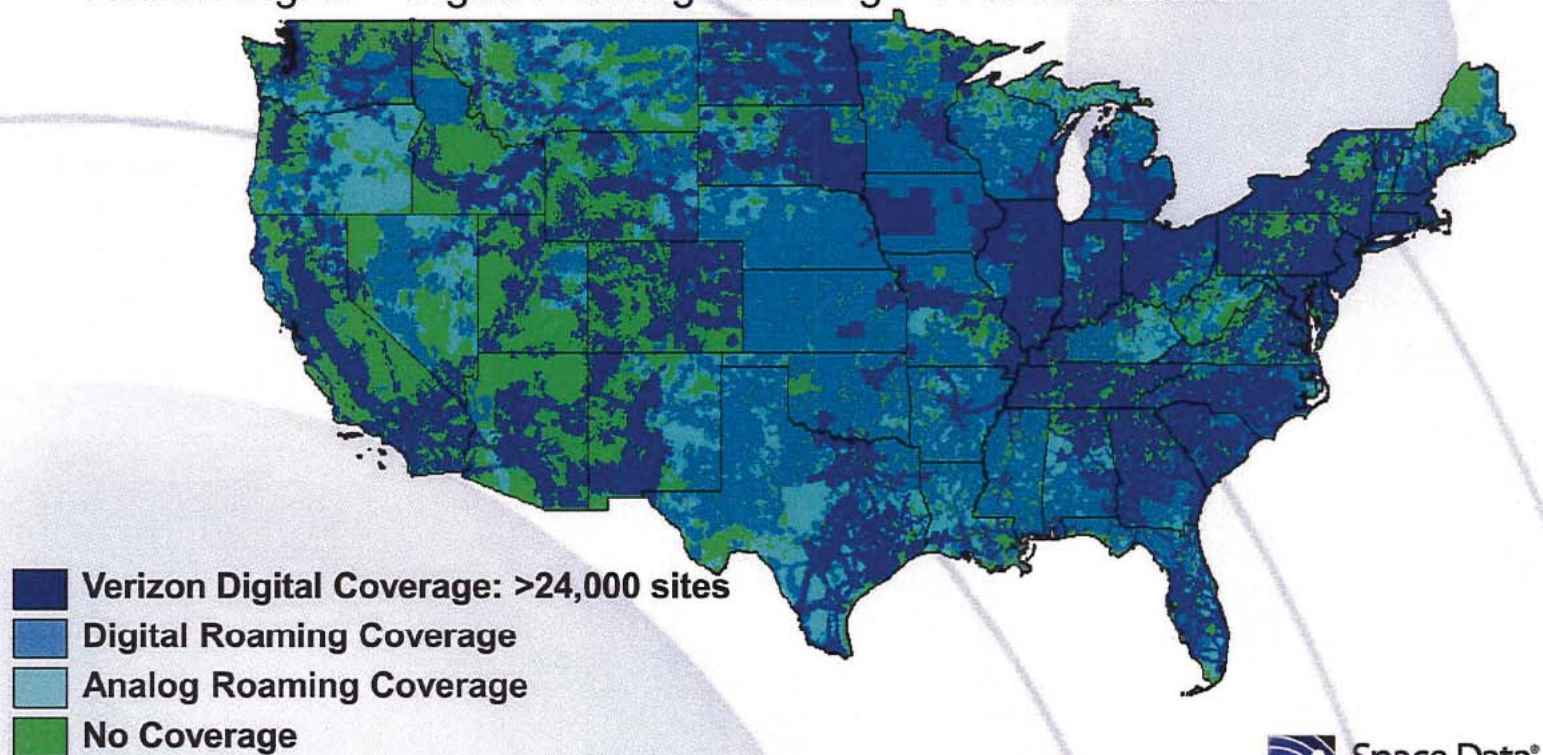
- 10 x 10 mile grids are about 50% of coverage of a rural tower site
- SkySites platform of choice for dark and most of light green areas
  - 93% of area: (dk. green = 46% of area, lt. green = 47% of area)





## Coverage of Current 850 MHz CDMA Carriers

- Verizon Digital Coverage = 36% Landmass
- Verizon Digital + Digital Roaming = 68% Landmass
- Verizon Digital + Digital / Analog Roaming = 77% Landmass



*Note: Population & Area Statistics for Continental US at Census Block level resolution*

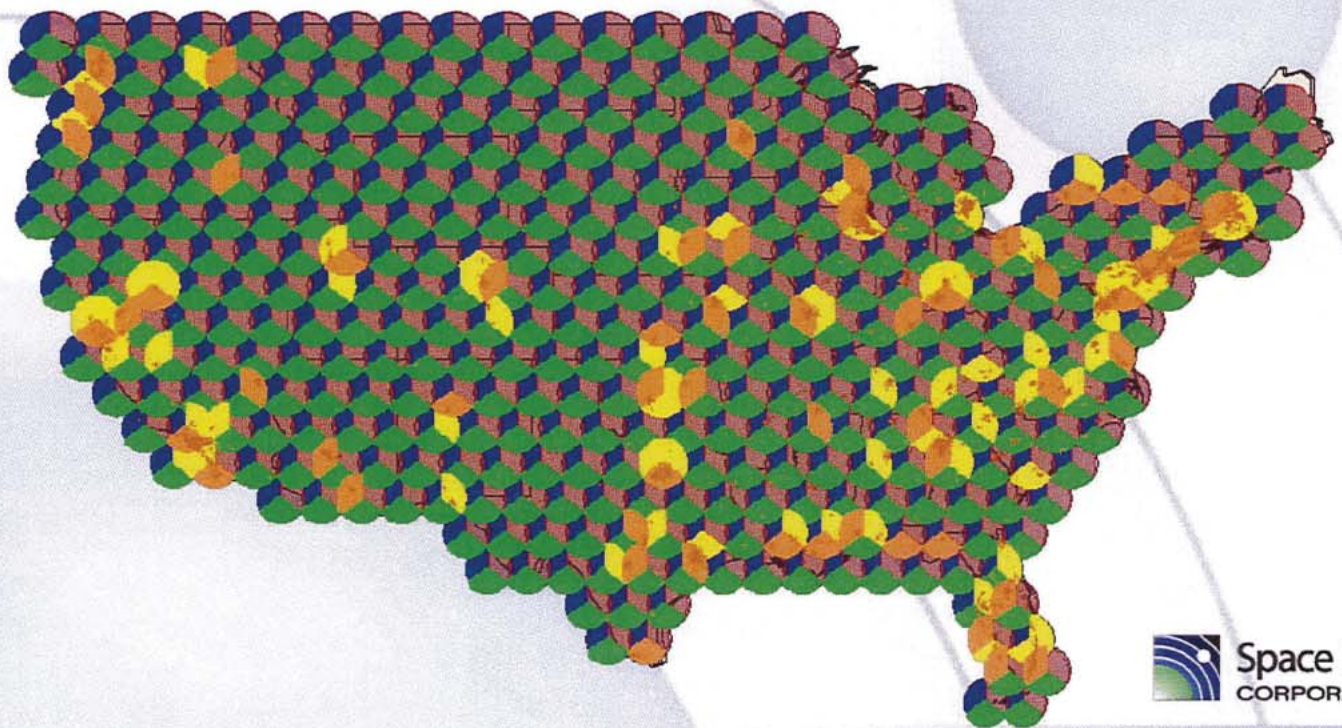
*Alaska & Hawaii comprise <1% of population and >16% of landmass*

*Coverage maps downloaded 10/21/07 from <http://www.verizonwireless.com/b2c/CoverageLocatorController>*



## WiMAX Network with SkySites & Towers

- Towers are initially built in urban areas which are 66% of population, but less than 2.5% of area
- 371 SkySites provide ubiquitous coverage of Continental US
- Each SkySite has 3 sectors with a reuse pattern of 3
  - When over urban areas sectors use the fringe channels

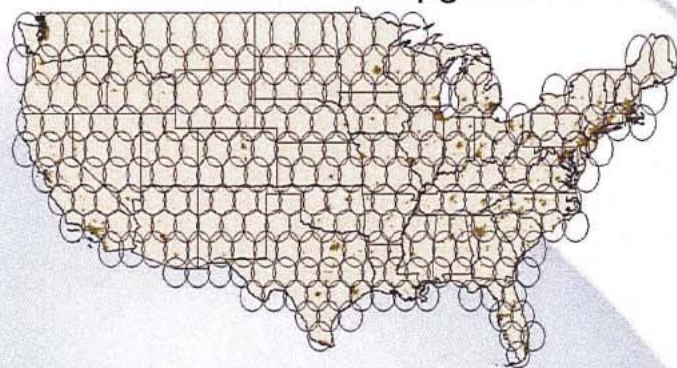


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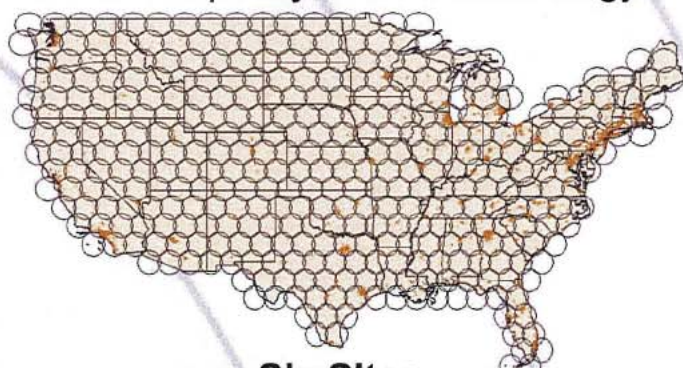


## SkySite Network provides More Devices, Lower Latency, & More Capacity than Satellites

- SkySites compatible with terrestrial user devices (i.e. dual mode not needed)
- GEO Satellites have inherent 240 ms latency that slows data transmissions
  - SkySite Platforms have 0.6 ms latency (372 times faster)
- Largest planned GEO satellite antenna can project at most 240 spot beams for Continental US with freq. reuse pattern of 7 due to interbeam interference
- 368 SkySites cover Continental US, each with 3 sectors and freq. reuse of 3
  - Capacity of SkySite Network is 11 times the capacity of a GEO Satellite with equal bandwidth of spectrum:  $(368 \times 3 / 3 \text{ vs. } 240 / 7)$
  - Satellites have fixed capacity over 15 yr life whereas capacity of SkySite Network can be upgraded if needed for more capacity or new technology



**Smallest Available GEO Satellite Spot Beams**  
**0.35 deg. from 22 meter antenna**  
(spot beams elongate due to view from satellite at equatorial orbit)



**SkySites**  
**each**  
**with 3 sectors**



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Notes Summary:

No speaker notes are contained in this presentation.

## **EXHIBIT 40**

**REDACTED VERSION OF  
DOCUMENT SOUGHT TO BE  
SEALED**



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Case No.  
5:16-cv-03260  
-BLF

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FRIDAY, MAY 11, 2018

VIDEOTAPED DEPOSITION OF EDWARD DANIEL McCLOSKEY

HIGHLY CONFIDENTIAL, ATTORNEYS' EYES ONLY

---o0o---

REPORTER: BALINDA DUNLAP, CSR 10710, RPR, CRR, RMR  
438063



(858) 455-5444 San Diego  
(800) 222-1231 Carlsbad  
(800) 222-1231 Monterey  
(516) 277-9494 Garden City  
(914) 510-9110 White Plains  
001+1+800 222 1231 Hong Kong

IN THE UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA  
SAN JOSE DIVISION

---o0o---

SPACE DATA CORPORATION, )  
 )  
Plaintiff, )  
 )  
vs. )  
 )  
ALPHABET, INC., and GOOGLE, )  
INC., )  
 )  
Defendants. )  
 )

Case No.  
5:16-cv-03260  
-BLF

---o0o---

FRIDAY, MAY 11, 2018

VIDEOTAPED DEPOSITION OF EDWARD DANIEL McCLOSKEY

HIGHLY CONFIDENTIAL, ATTORNEYS' EYES ONLY

---o0o---

REPORTER: BALINDA DUNLAP, CSR 10710, RPR, CRR, RMR

1 Q. Just yes or no, were you aware of whether  
2 there were any measures in place to ensure the  
3 Project Loon team was not using Space Data's  
4 intellectual property?

04:54 5 MR. WONG: Objection; vague, calls for  
6 speculation.

7 THE WITNESS: I am not aware of any  
8 measures. I am not aware of any measures.

9 Q. BY MS. HEATON: So that's a no.

04:54 10 In fact, there's communication between  
11 those who visited Space Data and individuals who  
12 worked on the Project Loon team, correct?

13 MR. WONG: Objection; vague.

14 THE WITNESS: As evidenced by these  
04:54 15 emails, yes.

16 MS. HEATON: I will mark as Exhibit 61 an  
17 email bearing the Bates range GOOG-SD-00158228  
18 through 242.

19 (Reporter marked Exhibit No. 61 for  
04:55 20 identification.)

21 Q. BY MS. HEATON: This is an email from  
22 Larry Alder from March 29, 2011, correct?

23 A. Correct.

24 Q. And he's sending the email to you?

04:56 25 A. Correct.

1 Q. And what's the title?

2 A. "Some old Space Data slides."

3 Q. And Larry says, "Here's an old deck from  
4 Space Data from back in the day," correct?

04:56 5 A. Correct.

6 [REDACTED]

7 [REDACTED]

8 [REDACTED]

9 [REDACTED]

10 [REDACTED]

11 MR. WONG: Objection; assumes facts.

12 THE WITNESS: This is in relation to the

13 -- what we mentioned before about Paul Kolodzy

14 trying to basically do spectrum measurements,

04:56 15 broad-scale spectrum measurements.

16 Q. BY MS. HEATON: So Larry sent around what  
17 he called old slides from Space Data at that point,  
18 correct?

19 A. That's what it looks like.

04:57 20 Q. Do you recall reviewing the Space Data  
21 slides in 2011?

22 A. I recall looking at this chart.

23 Q. On page what?

24 A. 235.

04:57 25 Q. And why did you look at that chart?



1 DEPOSITION OFFICER'S CERTIFICATE

2 STATE OF CALIFORNIA )  
 ) ss.  
 3 COUNTY OF SAN FRANCISCO )

4  
 5  
 6 I, BALINDA DUNLAP, hereby certify:

7 I am a duly qualified Certified Shorthand  
 8 Reporter in the State of California, holder of  
 9 Certificate Number CSR 10710 issued by the Certified Court  
 10 Reporters' Board of California and which is in full  
 11 force and effect. (Fed. R. Civ. P. 28(a)(1)).

12 I am authorized to administer oaths or  
 13 affirmations pursuant to California Code of Civil  
 14 Procedure, Section 2093(b) and prior to being examined,  
 15 the witness was first duly sworn by me. (Fed. R. Civ.  
 16 P. 28(a)(a)).

17 I am not a relative or employee or attorney or  
 18 counsel of any of the parties, nor am I a relative or  
 19 employee of such attorney or counsel, nor am I  
 20 financially interested in this action. (Fed. R. Civ. P.  
 21 28).

22 I am the deposition officer that  
 23 stenographically recorded the testimony in the foregoing  
 24 deposition and the foregoing transcript is a true record

25 / / /

1 of the testimony given by the witness. (Fed. R. Civ. P.  
2 30(f)(1)).

3 Before completion of the deposition, review of  
4 the transcript [ ] was [XX] was not requested. If  
5 requested, any changes made by the deponent (and  
6 provided to the reporter) during the period allowed, are  
7 appended hereto. (Fed. R. Civ. P. 30(e)).

8 Dated: JUNE 4, 2018

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